

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 9-16 are pending in the application, with claims 9, 12, 13, and 16 being the independent claims. Claims 1-8 and 17-18 are sought to be cancelled without prejudice or disclaimer.

Based on the above Amendment and the following Remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Interview Summary

The Applicant kindly thanks the Examiner for the telephone interview on June 16, 2003, and now makes the substance of the interview of record per 37 C.F.R. § 1.133(b).

During the interview, the Applicant's representative described the invention as recited by the claims and explained the differences between the invention and the applied references. Applicant's representative explained to the Examiner that claims 9-16 recite a 2-step etching of the titanium nitride layer, which is not taught by the cited prior art. The Examiner responded by stating that the Derderian reference teaches repeating the etching of titanium nitride using a hydrogen peroxide-water solution. Applicant's representative then distinguished the claims by asserting that the etching recited in claims 9-16 uses *two different mixtures*, namely, ammonia-hydrogen peroxide-water and hydrogen peroxide-water, *to remove first and second portions of*

the titanium nitride film, respectively. The Examiner agreed with these distinguishing factors and stated that an updated search would be performed to confirm patentability.

Rejections under 35 U.S.C. § 103(a)

The Examiner rejects claims 1-16 under 35 U.S.C. § 103(a) as being unpatentable over applicant's admitted prior art in view of U.S. Patent No. 6,245,191 to Derderian. Applicant respectfully traverses this rejection.

Independent claims 9, 12, 13, and 16 relate to a method of etching semiconductor devices. Claims 9, 12, 13, and 16 recite the steps of "removing a first portion of said titanium nitride ...by using an ammonia-hydrogen peroxide-water mixture...and removing said second portion of said titanium nitride film...by a second step using a hydrogen peroxide-water mixture *so as to expose a surface of the cobalt silicide film without etching there of.*" Reading these claims on Figures 2A-2F, as shown in Figure 2D, titanium nitride film 62 is removed using an ammonia-hydrogen peroxide-water mixture, only for a time with which the CoSi layer will not be exposed, even where film thickness is thinnest. Next, as shown in Figure 2E, the remaining titanium nitride film 62 is removed using a hydrogen peroxide-water mixture.

As noted in the Office Action, Applicant's admitted prior art fails to teach using a hydrogen peroxide-water mixture for etching titanium nitride. Derderian is cited as teaching this feature. Additionally, the Examiner asserts that Derderian teaches replenishing, i.e., repeating, the etching solution.

In comparison, claims 9, 12, 13, and 16 recite that a titanium nitride film which is arranged over cobalt silicide is removed by an etching process using two different mixtures, namely, using ammonia-hydrogen peroxide-water to remove a first portion of the titanium nitride film and then using hydrogen peroxide-water to remove a second portion of the titanium nitride film. None of the cited references teach or suggest using the 2-step process as recited in claims 9, 12, 13, and 16. Furthermore, there is no teaching or suggestion in the cited art of the removal of the second portion of the titanium nitride film to *expose a surface of the cobalt silicide film without etching there of*, as recited in claims 9, 12, 13, and 16.

In view of the discussion above, it is clear that the cited references do not teach or suggest the use of two different mixtures to etch titanium nitride so as to expose a surface of the cobalt silicide film without etching there of. Therefore, withdrawal of this rejection is respectfully requested.

The remaining claims 10-11 and 14-15 depend directly or indirectly from one of the independent claims discussed above and are patentable over the applied references for at least the same reasons.

Applicants: Kaori TAI
Appl. No. 09/639,163

Conclusion

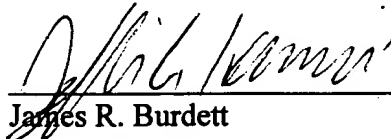
All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is hereby invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

Date: _____

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James R. Burdett
Registration No. 31,594
Jeffri A. Kaminski
Registration No. 42,709
VENABLE
P.O. Box 34385
Washington, D.C. 20043-9998
Telephone: (202) 962-4800
Telefax: (202) 962-8300